

R E M A R K S

Reconsideration of this application, as amended, is respectfully requested.

THE DRAWINGS

Figures 35-42 have been amended to be labeled as "Prior Art" as required by the Examiner.

Submitted herewith are corrected sheets of formal drawings which incorporate the amendments and annotated sheets showing the changes made thereto.

No new matter has been added, and it is respectfully requested that the Examiner's objection to the drawings be withdrawn.

THE CLAIMS

Independent claim 13 has been amended to recite that the bell crank is constructed and connected to the tilt cylinder and the boom, the tilt cylinder is constructed and connected to the bell crank and the structural body, and the boom is constructed and connected to the bell crank and the structural body to provide the attachment with the ground position, a top position and at least one intermediate position between the ground position and the top position in which the attachment has the same posture and maintains a pivot axis of the tilt cylinder to

the bell crank radially outward of a pivot axis of the boom to the bell crank in all of the ground position, the at least one intermediate position and the top position while the attachment has the same posture. See, for example, Fig. 3, wherein an attachment, bucket 20, is shown in a ground position, a top position and an intermediate position. In each of these positions, the bucket 20 has the same posture, i.e., with its bottom parallel to the ground, and the pivot axis W of the tilt cylinder to the bell crank 11 is radially outward of the pivot axis Y of the boom 10 to the bell crank 11 (from either center axis Z or S).

With respect to the clause "when the attachment is horizontally at a ground position" in claim 13, it is respectfully pointed out that this clause is necessary because the relative location of the ends of the bell crank varies during pivoting of the boom. Thus, the "upper end" of the bell crank 11, to which the second end of the tilt cylinder is pivotally supported, when the attachment, bucket 20, is horizontally at a ground position may not always be more "upper" than the "lower" end of the bell crank 11, to which the connecting link 13 is connected. However, the end of the bell crank to which the tilt cylinder is pivotally supported is always the "upper" end "when the attachment is horizontally at a ground position" as claimed and shown in Fig. 3. Therefore, the clause

is necessary to enable an accurate recitation of the ends of the bell crank.

With respect to the recitation of the angles in claim 21, it is respectfully pointed out that the attachment angle when the attachment is at the middle position and the attachment angle when the attachment is at the top position are substantially equal, but opposite in sign (one positive, the other negative), i.e., the absolute values are substantially equal as recited in paragraph 0036 on page 13 of the specification. Thus, the sum of the attachment angles is indeed substantially 0 degrees, as set forth in claim 21.

Still further, it is respectfully pointed out that claims 11, 14-17, 19, 23 and 27 have been canceled, without prejudice.

No new matter has been added, and it is respectfully requested that the amendments to the claims be approved and entered, and that the rejection of the claims under 35 USC 112 has been overcome and should be withdrawn.

THE PRIOR ART REJECTION

The pending claims (namely, claims 13, 21, 25 and 29) were rejected under 35 USC 103 as being obvious over the combination of JP 63-22499 and USP 5,201,235 ("Sutton") or USP 4,154,349 ("Christensen"). This rejection, however, is respectfully traversed with respect to the claims as amended hereinabove.

According to the present invention as recited in amended independent claim 13, a working machine is provided which comprises a boom having a first end attached to a structural body, an attachment attached to a second end of the boom, a bell crank attached to a middle position of the boom in a longitudinal direction thereof, a tilt cylinder having a first end pivotally supported on the structural body and a second end pivotally supported on an upper end of the bell crank when the fork is horizontally at a ground position, a boom cylinder having a first end pivotally supported on the structural body and a second end pivotally supported on the boom, and a connecting link for connecting a lower end of the bell crank and the attachment when the attachment is horizontally at a ground position.

In addition, as recited in amended independent claim 13, a pivot position of the tilt cylinder to the structural body is below a pivot position of the boom to the structural body, and a pivot position of the boom cylinder to the structural body is above a pivot position of the boom to the bell crank when the fork is horizontally at a ground position. These features are shown, for example, in Fig. 10, wherein the pivot position (Z) of the tilt cylinder 12 to the structural body 16A is below a pivot position (S) of the boom 10 to the structural body 16A, and a pivot position of the boom cylinder (17) to the structural body (16A) is above a pivot position (Y) of the boom (10) to the bell

crank (11) when an attachment, i.e., the fork (30), is horizontally at a ground position. Figs. 1 and 13 show similar features with the working machine including a bucket 20 instead of a fork 30.

Still further, according to the present invention as recited in amended independent claim 13, the bell crank is constructed and connected to the tilt cylinder and the boom, the tilt cylinder is constructed and connected to the bell crank and the structural body, and the boom is constructed and connected to the bell crank and the structural body to provide the attachment with the ground position, a top position and at least one intermediate position between the ground position and the top position in which the attachment has the same posture and maintains a pivot axis of the tilt cylinder to the bell crank radially outward of a pivot axis of the boom to the bell crank in all of the ground position, the at least one intermediate position and the top position while the attachment has the same posture. In other words, a locus of the pivot position of the tilt cylinder to the bell crank 11 (the pivot axis of the tilt cylinder to the bell crank 11) is not crossed with a locus of the pivot position of the bell crank 11 to the boom 10 (the pivot axis of the bell crank 11 to the boom 10) while the boom 10 moves from the ground position to a (maximum) top position.

Attached hereto are Reference Figs. 3 and 4 wherein the path of the pivot axis (W) of the tilt cylinder to the bell crank 11 and the pivot axis (Y) of the boom 10 to the bell crank 11 are drawn from the ground position of the bucket 20 to the top position, through the intermediate position. As clearly shown, the pivot axis of the tilt cylinder to the bell crank 11 is always radially outward from the pivot axis of the boom 10 to the bell crank 11 during movement of the boom 10.

With the structure of the claimed present invention, unexpected results are obtained during use of the working machine. First, the angle characteristics of the attachment from the ground position to the top position are improved, irrespective of the posture of the attachment at the ground position (i.e., in a horizontal posture and a tilted posture). Second, the angle characteristics are improved when the attachment is either a bucket or a fork, i.e., improved angle characteristics are obtained for both types of attachments. Third, the tilting force at the top position of the attachment, which is required when a fork is used, are greatly and even more unexpectedly improved in comparison to prior art working machines.

It is respectfully submitted that the cited references do not disclose or suggest the above described structural features and advantageous effects of the present invention as recited in amended independent claim 13.

In particular, it is respectfully pointed out that JP 63-22499, Sutton and Christensen do not disclose the specified constructions and/or interconnections of a bell crank, a tilt cylinder, a boom and a structural body to provide an attachment with specific positions in which the attachment has the same posture and maintains a pivot axis of the tilt cylinder to the bell crank radially outward of a pivot axis of the boom to the bell crank in all of the positions while the attachment has the same posture, as according to the present claimed invention. Indeed, the cited references completely fail to disclose these particular features relating to the construction and connection of the components of the working machine, and the structures disclosed in the cited references cannot achieve the advantageous angle characteristics achieved by the claimed present invention.

In addition, it is respectfully submitted that it would not have been obvious to modify JP 63-22499 in view of Sutton or Christensen and arrive at the present claimed invention because the references disclose significantly different link mechanisms and lack a teaching of synthesizing the different link mechanisms into the particular link mechanism recited in amended independent claim 13. For example, the link mechanism of Sutton is pivoted to the bell crank and to the tilt cylinder at locations different from those of the link mechanism disclosed in JP 63-22499, while Christensen discloses a tilt cylinder that is not attached to the

structural body as is the tilt cylinder in JP 63-22499. In view of the differences in the connections of the link mechanisms and tilt cylinders of Sutton and Christensen, it is respectfully submitted that it would not have been obvious to one of ordinary skill in the art to modify JP 63-22499 in view of Sutton or Christensen to achieve the structure of the working machine of the present invention as recited in amended independent claim 13.

Accordingly, it is respectfully submitted that amended independent claim 13 and claims 21, 25 and 29 depending therefrom clearly patentably distinguish over the cited references, taken singly or in any combination, under 35 USC 103.

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Entry of this Amendment, allowance of the claims and the passing of this application to issue are respectfully solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned for prompt action.

Respectfully submitted,

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